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Differential Cross Sections of Two-Photon Double Ionization of He From Time-Independent and Time-Dependent Calculations[1] DANIEL HORNER, Los Alamos National Laboratory, ALICIA PALACIOS, THOMAS RESCIGNO, Lawrence Berkeley National Laboratory, C. WILLIAM MCCURDY, Lawrence Berkeley National Laboratory and University of California, Davis — The method of exterior complex scaling allows us to compute numerically converged time-independent and time-dependent wave functions describing two unbound electrons on a large, but finite volume. With these wave functions, using formally exact integral methods, we are able to extract the observable cross sections. We present total, single differential, and fully differential cross sections for two-photon double ionization of helium above and below the threshold for sequential ionization (54.4 eV). The sequential, two step, double ionization mechanism produces characteristic features seen in the total and differential cross sections. Furthermore, the fully differential cross section shows that even below the sequential ionization threshold two-photon double ionization is largely a process where each electron absorbs a single photon and then correlation between the electrons leads to double ionization.

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